

US009409606B2

# (12) United States Patent

#### Eshima et al.

## (54) CABIN FRONT STRUCTURE OF AUTOMOBILE

(71) Applicant: TOYOTA JIDOSHA KABUSHIKI

KAISHA, Toyota-shi (JP)

(72) Inventors: Mitsuaki Eshima, Okazaki (JP);

Kazuya Tokunaga, Toyota (JP)

(73) Assignee: TOYOTA JIDOSHA KABUSHIKI

KAISHA, Toyota-shi (JP)

(\*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 14/784,672

(22) PCT Filed: Apr. 10, 2014

(86) PCT No.: PCT/IB2014/000513

§ 371 (c)(1),

(2) Date: Oct. 15, 2015

(87) PCT Pub. No.: WO2014/170732

PCT Pub. Date: Oct. 23, 2014

(65) **Prior Publication Data** 

US 2016/0059900 A1 Mar. 3, 2016

#### (30) Foreign Application Priority Data

Apr. 19, 2013 (JP) ...... 2013-088890

(51) Int. Cl.

**B62D 25/14** (2006.01) **B60R 21/206** (2011.01) **B60R 21/231** (2011.01)

(52) U.S. Cl.

## (10) Patent No.:

US 9,409,606 B2

(45) **Date of Patent:** 

Aug. 9, 2016

#### (58) Field of Classification Search

#### (56) References Cited

#### U.S. PATENT DOCUMENTS

5,564,769 A *	10/1996	Deneau	B62D 25/145
7,407,221 B2*	8/2008	Kring	180/90 B62D 25/145

#### (Continued)

#### FOREIGN PATENT DOCUMENTS

DE 10 2007 032 4 1/2009 DE 10 2011 101 883 A1 11/2011 (Continued)

#### OTHER PUBLICATIONS

International Search Report Issued Sep. 5, 2014 in PCT/IB14/000513 Filed Apr. 10, 2014.

(Continued)

Primary Examiner — Nicole Verley (74) Attorney, Agent, or Firm — Oblon, McClelland, Maier & Neustadt, L.L.P

### (57) ABSTRACT

When a front pillar on a driver's seat side is deformed to a vehicle rear side due to short overlap collision on the driver's seat side of an automobile, an instrument panel reinforcement bridged between left and right front pillars is bent at a long hole serving as a starting point and provided on an outer side of a column bracket in a vehicle width direction. Due to this, a steering column, which is mounted on the instrument panel reinforcement through the column bracket, is restrained from being displaced due to a load from the front pillar.

#### 7 Claims, 7 Drawing Sheets

